

New Caledonian Tiphiiidae: Revision of the Genus *Eirone* (Hymenoptera: Thynninae)

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Abstract.—Ten new species of New Caledonian *Eirone* are described based on males, including *anone* Kimsey, *irvini* Baptiste, *koghisica* Kimsey, *laniensis* Baptiste, *maigretae* Baptiste, *nasalis* Kimsey, *nepouiensis* Baptiste, *paniensis* Kimsey, *riveriensis* Baptiste, and *webbi* Kimsey. In addition, females of *irvini*, *transversa* Brown, *nepouiensis*, and *webbi*, are also described. Male genitalia are described and illustrated for both the new species and for the first time for *colorata* Brown, *marginata* Brown, *neocaledonica* Turner, *nigra* Brown, *obtusidens* Turner, *salteri* Brown, *subtuberculata* Brown and *transversa* Brown. These previously described species are also rediagnosed. A key to males of the species of New Caledonian *Eirone* is also included.

As recently as the early 1980's only nine species of *Eirone* Westwood were known from New Caledonia (Brown 1984). Subsequent malaise trap collecting by Michael Irwin, Evert and Marion Schlinger and Donald Webb have demonstrated that the thynnine fauna of New Caledonia is substantially richer than previously thought. Their efforts have turned up ten undescribed species of *Eirone*. Based on their collecting efforts, *Eirone* appears to be the only thynnine genus present on New Caledonia.

MATERIALS AND METHODS

Specimens were obtained for this study from the following institutions and individuals: Bernice P. Bishop Museum, Honolulu, Hawaii, G. Nishida (HONOLULU); Illinois Natural History Survey, University of Illinois, Champaign-Urbana, M. E. Irwin (URBANA), Canadian National Insect Collection, Ottawa, Ontario, L. Masner (OTTAWA), University of California, Davis, S. L. Heydon (DAVIS). Holotypes of the new species described below will all be deposited in the Muséum Nationale d'Histoire Naturelle, Paris (PARIS). The type of *Eirone impunctata* Brown was to

have been deposited in the collection of the Rydalmere Quarantine Station, NSW. This collection has been moved to the Agricultural Scientific Collections Unit, NSW Agriculture, Orange Agricultural Institute, Orange, Australia (P. S. Gillespie). However, the type cannot be located. Specimen and type repositories are indicated in the text by the city name in capital letters.

The following abbreviations are used for the sake of brevity: F = flagellomere, MOD = midocellus diameter, PD = puncture diameter.

SPECIES DESCRIPTIONS

Eirone anone Kimsey, new species (Fig. 19)

Male.—Body length 15–18 mm; forewing length 12–14 mm; face with tiny contiguous punctures between inner eye margins and antennal sockets; frons with punctures 0.5–2 apart, except impunctate along medial sulcus and adjacent to antennal socket; clypeus with punctures larger than along inner eye margin, punctures contiguous; clypeal apex broadly triangular, with single apicomedial lobe; F-I length 2.4–2.5× breadth; F-II length 3.0–

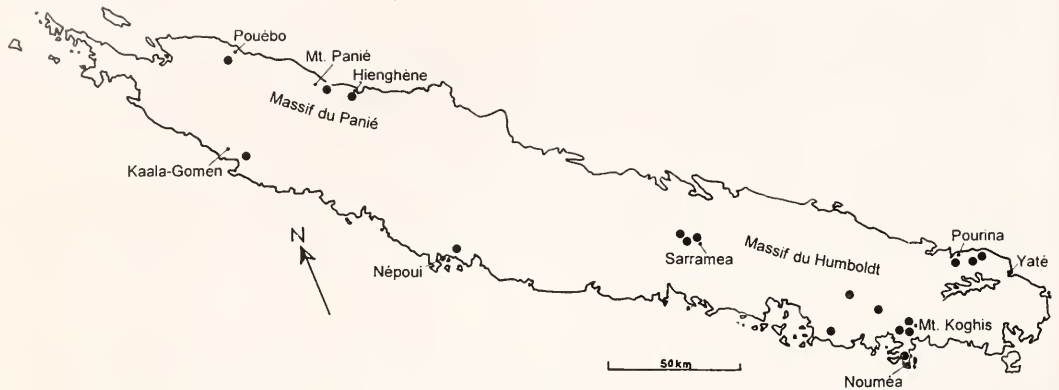


Fig. 1. Distribution map of *Eirone* species in New Caledonia.

3.2× breadth; pronotal punctures 1–3 PD apart; mesopleural punctures 1–2 PD apart separated by dense, fine shagreening; mesopleural lamella posteriorly rounded; scutal punctures densest along notauli (nearly contiguous), medially sparsest (0.5–1 PD apart); scutellum nearly impunctate medially, punctures denser laterally, 0.5–1.0 PD apart; propodeum punctate medially and laterally, punctures 0.5–1.0 PD apart, impunctate sublaterally; metasomal sternum I sharply keeled and somewhat hooked posteriorly, abruptly declivous posteriorly; epipygium and hypopygium flattened and apex narrowly subtruncate; genital capsule (Fig. 19): gonocoxa with medial angular lobe on inner surface; aedeagus apical column broad, and flattened apically, ending abruptly with rounded basal angle and narrow, hooked apical lobe, column extending more than half its length beyond penis valve bending dorsally; penis valve with short dorsal hook, hooked ventral lobe and elongate basal lobe; volsella with hooked bilobate dorsal surface and obsolescent asetose ventral surface; color: orange, with extensive black markings on vertex, extending down along side antennal sockets, on occiput, pronotum anteriorly and medially, scutum except large yellow medial spot, mesopleural margins, scutellum anteromedially, coxae dorsally, propodeum anterior margin black to en-

tirely black, metasomal segments I and VI entirely black, segment VII anterior margin black; gonocoxa orange; wing membrane yellow-tinted, veins black; vestiture long, erect and orange-colored.

Type material.—Holotype ♂; trail to Mt. Panié, 22 km NW Hienghène, 11–25 Nov. 1992, Webb & Schlinger, malaise trap (PARIS). Paratypes: 15 ♂♂, same data as holotype; 3 ♂♂, Mt. Mandjanié, 5.3 km WSW Pouébo, 500 m, 9–26 Nov. 1992, D. W. Webb, malaise trap (DAVIS, ILLINOIS). This species was collected in November.

Etymology.—The species name, *anone*, is a nonsense combination of letters, assumed to be feminine.

Discussion.—This species closely resembles *obtusidens* in coloration, presence of a midcoxal spine, rounded mesopleural lamella, and unilobate, densely setose clypeus. It can be immediately separated from *obtusidens* by the strongly keeled metasomal tergum I and apically acute aedeagus. The unilobate clypeus is unique to these two species.

Eirone colorata Brown (Fig. 9, 22)

Eirone colorata Brown 1984:254. Holotype ♂: New Caledonia: Col de Ho (HONOLULU), examined.

Male.—Body length 12–15 mm; fore-

wing length 9–12 mm; face with tiny contiguous punctures between inner eye margins and antennal sockets; frons with punctures 1–4 PD apart; clypeus with punctures larger than along inner eye margin, punctures 0.5–1.0 PD apart; clypeal apex broadly truncate, 2.6–2.8 MOD wide; F-I length $2.2\times$ breadth; F-II length $2.8\times$ breadth; pronotal punctures 1–4 PD apart; mesopleural punctures 1–2 PD apart, finely, shagreened between; mesopleural lamella rounded apically; scutum medially, with punctures 1.0–1.5 PD apart, punctures becoming finer and denser laterally, 0.5–1.0 PD apart; scutellar punctures 1–4 PD apart; propodeum punctate medially and laterally, punctures 0.5–1.0 PD apart, impunctate sublaterally, finely and densely shagreened between punctures; midcoxa with apical spine (Fig. 9); metasomal sternum I keeled medially, keel extending two-thirds of length, sloping obliquely to posterior margin; epipygium and hypopygium flattened and broadly rounded apically; genital capsule (Fig. 22): gonocoxa with low submedial angular projection on inner surface; aedeagus unmodified, with slender apical column extending less than half its length beyond penis valve, and bending ventrally; penis valve saddle-shaped with short dorsal hook; volsella with small bilobate dorsal projection and ventral surface with 6–8 long erect setae; color orange, becoming yellower on face, pronotum, tegula and subalar region of mesopleuron; scape orange, flagellum dark brown, black markings on vertex, pronotal middle, scutum black except large medial mark and sides yellow, scutellum anteriorly black, propodeum anteriorly, mesopleuron along dorsal margin, coxae and femoral dorsal margin, metathorax laterally, apical abdominal segments darker; wing membrane yellow-tinted, veins black; pubescence silvery on head and thorax and black on metasoma.

Material examined.—21 ♂♂ (including the holotype); Col de Ho, 22 km NW

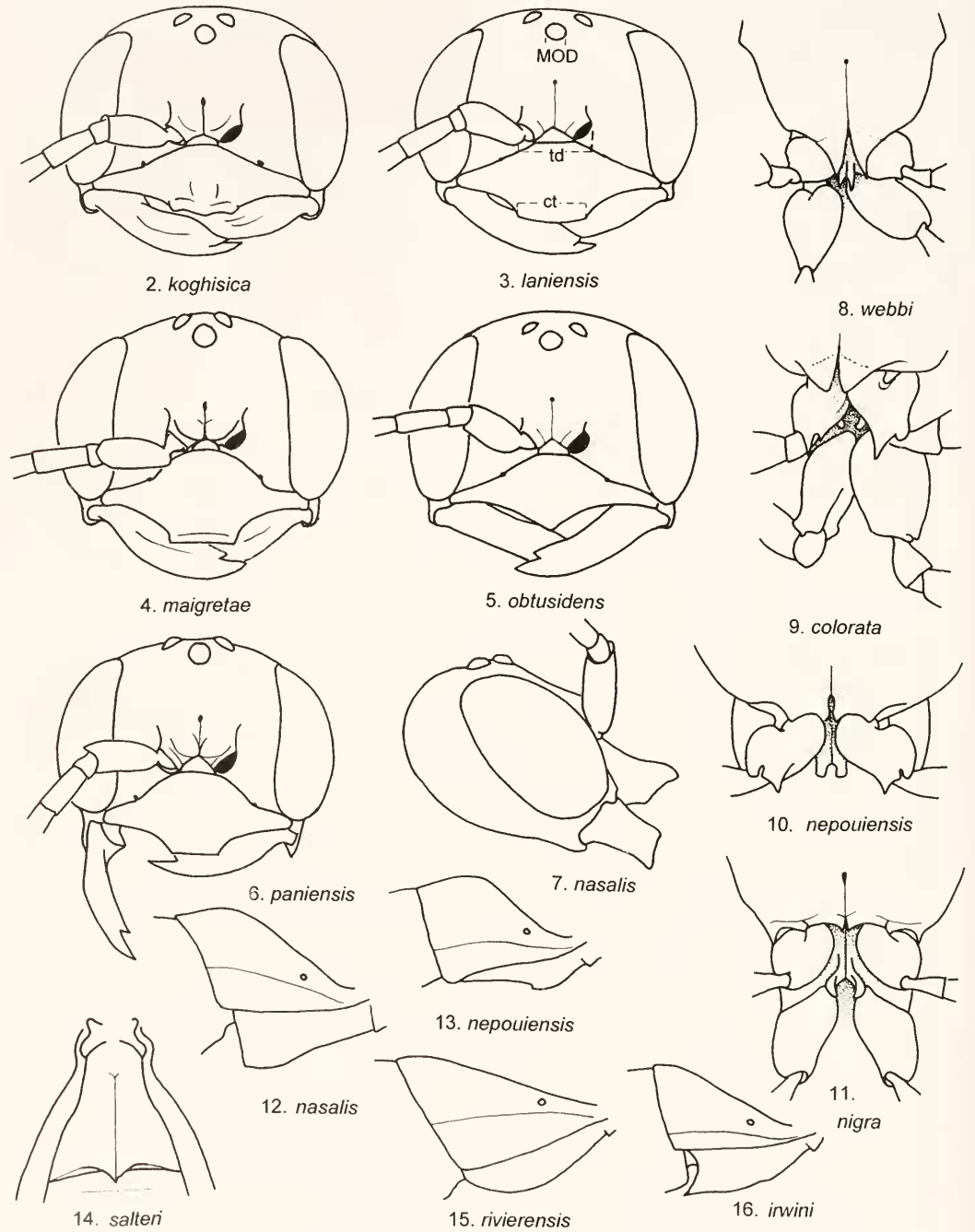
Hienghène (trail to Mt. Panié), and Mt Panié, 9.7 km NW Sarraméa. These specimens were collected in the months of October, November, January and February.

Discussion.—*Eirone colorata* most closely resembles *rivierensis* based on the emarginate mesopleural lamellae, midcoxal spine, metasomal sternum I obliquely sloping posteriorly, and apically truncate clypeus. The two species differ in the vestiture of the abdominal terga, *rivierensis* has dense tufts of long black setae on T-VI and VII, which are lacking in *colorata*, and the aedeagus of *colorata* is small and unremarkable, whereas the apical aedeagal column in *rivierensis* is broadly flattened and subtriangular. Finally, *colorata* specimens are at least partly reddish orange, whereas *rivierensis* specimens lack this reddish orange coloration.

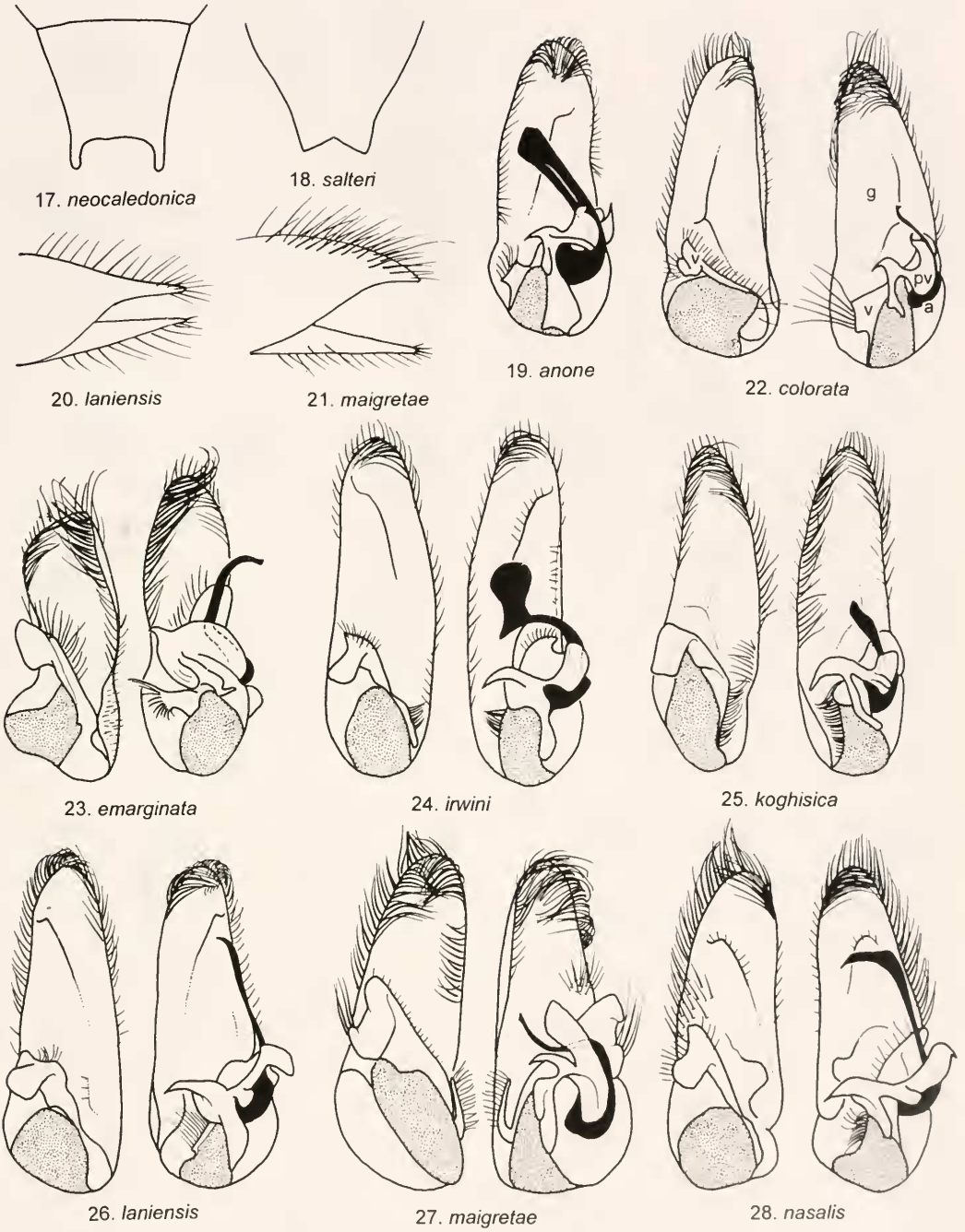
Eirone emarginata Brown (Fig. 23)

Eirone emarginata Brown 1984:256. Holotype ♂; New Caledonia: Col des Rousettes (HONOLULU), examined.

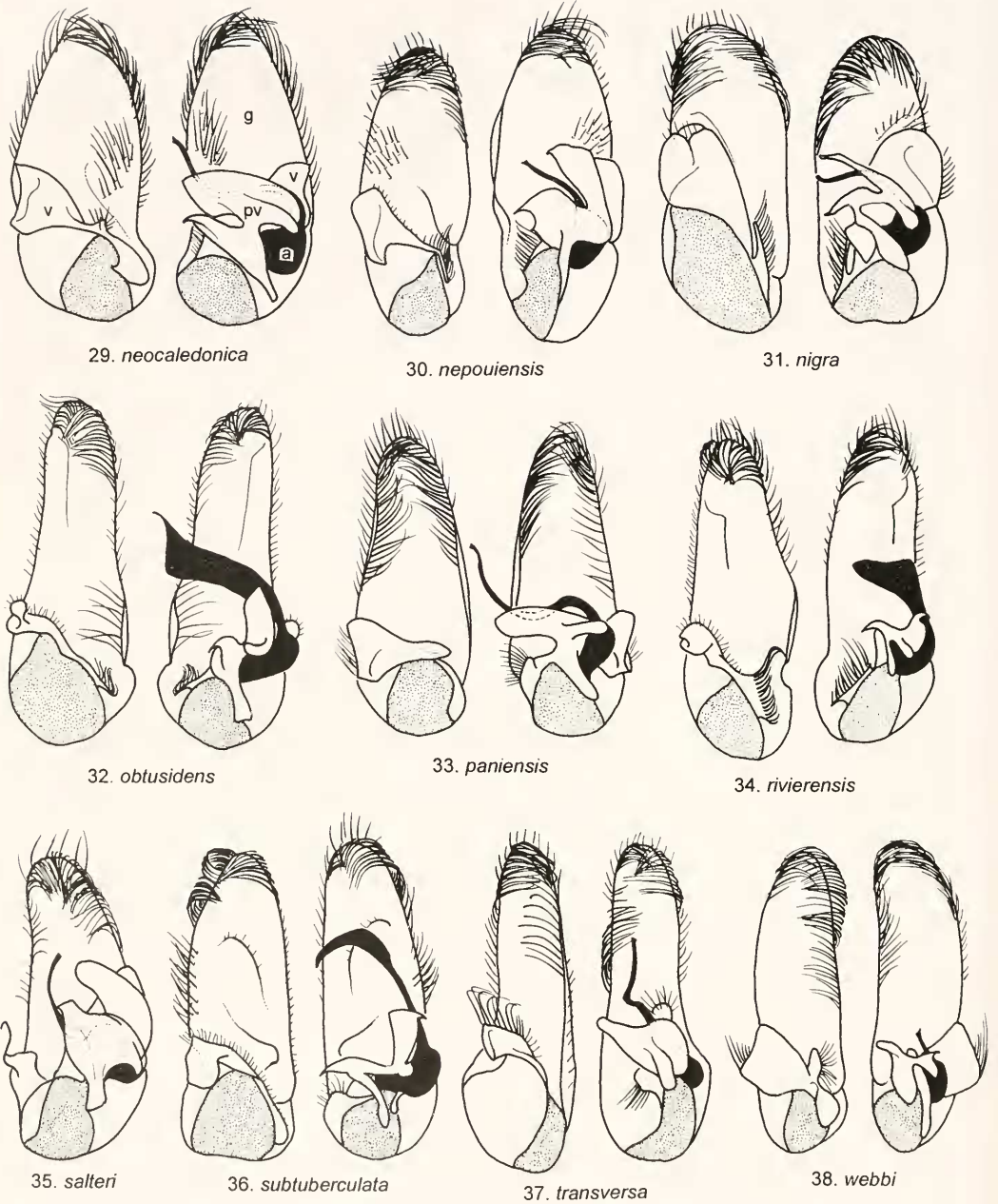
Male.—Body length 16–21 mm; forewing length 11–15 mm; face with tiny, contiguous punctures between inner eye margins and antennal sockets; frons with punctures irregular, 0.5–1.0 PD apart, except impunctate medial sulcus; clypeus convex medially, with punctures larger than along inner eye margin, punctures contiguous to 0.5 PD; antennal lobe with small subsidiary ventrally projecting lobe; clypeal apex medially emarginate, acutely pointed on either side, 2.6 MOD wide; F-I length $2.5\times$ breadth; F-II length $3.0\times$ breadth; pronotal punctures 0.5–1.0 PD apart; mesopleural punctures 0.5 PD apart; mesopleural lamella short, posteriorly emarginate; scutal punctures medially 0.5–1.0 PD apart, becoming finer and nearly contiguous laterally; scutellar punctures large and 0.5–1.0 PD apart near midline becoming smaller, denser and nearly contiguous laterally; propodeum



Figs. 2-16. *Eirone* species. 2-6, Front view of male face, with right antenna removed. 7, Lateral view of male face. 8, 10, Ventral view of male meso- and metathorax. 9, Oblique ventral view of male meso- and metathorax. 11, Ventral view of male mesothorax. 12-15, Lateral view of male metasomal segment I. 16, Ventral view of male metasomal segment I. Abbreviations: ct = clypeal truncation, MOD = midocellus diameter, td = transantennal distance.



Figs. 17–28. *Eirone* species. 17–19, Dorsal view of male epipygium. 20–21, Lateral view of male abdominal apex. 22–28, Interior surfaces of genital capsule. Abbreviations: a = aedeagus, g = gonocoxa, pv = penis valve, v = volsella.



Figs. 29–38. *Eirone* species, Interior surfaces of genital capsule. Left side gonocoxa and volsella. Right side penis valve uppermost. Inner margins of both sides are the ventral surface of the genital capsule; outer margins are the dorsal surface. 35, Right side of genital capsule only. Abbreviations: a = aedeagus, g = gonocoxa, pv = penis valve, v = volsella.

punctate medially and laterally, punctures 1–2 PD apart, impunctate sublaterally; midcoxa without apical spine; metasomal sternum I with short, carinate medial keel

extending half length, sloping obliquely to posterior margin; epipygium strongly convex, posterior margin broadly rounded, with slight indentation medially; hypo-

pygium flat, broadly rounded apically; thorax and metasoma finely and densely shagreened between punctures; genital capsule (Fig. 23): gonocoxa narrowed medially, inner surface smooth without projections, ridges or lobes; aedeagus apical column elongate, extending more than half its length beyond penis valve, bending abruptly ventrally; penis valve leaf-like with small dorsal hook; volsella with large hoof-like dorsal lobe, ventral lobe with short spine-like setae; color black, with small, pale yellow spot on antennal lobe, genital capsule yellow to orange; wing membrane brown-tinted, veins black; pubescence silvery.

Material examined.—9 ♂♂ (including the holotype); 22 km NW Hienghène; Rivière Bleue Prov. Pk., km 25.8 Rivière Bleue Road; 7.5 km NW Sarraméa; 17 km nne Nouméa; Rivière Bleue Prov. Pk., trail to Valle de Pourina (DAVIS, HONOLULU, URBANA). Specimens were collected in October, November and February.

Discussion.—As discussed under *webbi*, there are five species of New Caledonian *Eirone* that lack a midcoxal spine. Of these *emarginata* and *maigretae* are most similar. Both are large-bodied, with the epipygium broadly rounded apically and strongly convex in profile, and both have a sharply cornered clypeal truncation. Diagnostic features of *emarginata* include the medially emarginate clypeal truncation, black body and apically truncate hypopygium.

Eirone impunctata Brown

Eirone impunctata Brown 1984:256. Holotype ♂: New Caledonia: Forêt de la Thy (Repository?).

Material examined.—No specimens of this species have been seen. The type is apparently unavailable. According to Brown (1984) the holotype was collected in April.

Discussion.—See *webbi*.

Eirone irwini Baptiste, new species (Figs. 16, 24)

Male.—Body length 15–17 mm; forewing length 12–14 mm; face with small, nearly contiguous punctures between inner eye margins and antennal sockets; frons with punctures 0.5–1 PD apart, except nearly impunctate medial longitudinal band; clypeus with punctures much larger than along inner eye margin and nearly contiguous; clypeal apex weakly trilobate, with medial lobe extending furthest, distance between outer lobes 3.3 MOD; F-I length 2.4–2.5× breadth; F-II length 3.4–3.5× breadth; pronotal punctures 1–3 PD apart; mesopleural punctures 1–2 PD apart medially, finely shagreened between; mesopleural lamella apically rounded and bending slightly ventrally; scutal punctures medially 1–2 PD apart, becoming finer and denser laterally 0.5 PD apart; scutellar punctures 1–1.5 PD apart, except for medial longitudinal impunctate stripe; propodeum punctate medially and laterally (punctures 1–2 PD apart), impunctate along sublateral band and above petiolar socket; metasomal sternum I sharply keeled medially, sloping obliquely to pointed apex, apex extending over base of metasomal sternum II (Fig. 16); epipygium narrowed and flattened apically, apical margin indented medially; hypopygium narrowly rounded apically; genital capsule (Fig. 24): gonocoxa with protruding submedial longitudinal ridge; aedeagus apical column arcuate, with apical flag, strongly bending dorsally; penis valve saddle-shaped, with long dorsal hook; volsella with large bilobate dorsal end, ventral part short, with brush of dense, stout setae. Body black, with yellow or cream-colored markings on: lower half of inner eye margins, lower two-thirds of outer eye margins, spot on upper inner of eye margin, spot on antennal lobe, transverse band on anterior carina of pronotum, anterolateral spot on pronotum, tegula basally, anterolateral edge of

scutellum, submedial spots on metanotum; wing membrane light brown, darkest near apex, with black veins; vestiture black on face and metasoma, silvery on rest of head and thorax.

Female.—Body length 11 mm; head and thorax coarsely punctate, punctures contiguous to 0.5 PD apart; abdominal punctures slightly smaller and 0.5–1.0 PD apart; frons with medial longitudinal sulcus, extending more than halfway to posterior head margin; clypeal margin centrally concave and pointed apically; F-I length 1.3× breadth, F-II length 1.6× breadth; propodeum subrectangular in dorsal view, with transverse basal carina and lateral edge marked by sharp carina; T-I punctures longitudinally striatiform; metasomal sternum I with short medial longitudinal carina; body dark brown to black, with pale, silvery setae.

Type material.—Holotype ♂ (flagellomeres affixed to point below specimen): NEW CALEDONIA, Sarraméa, 24 Dec. 1991, M. E. Irwin (PARIS). Paratypes: 6 ♂♂, 3 ♂♂, same data as holotype; 1 ♂, 1 ♀ (in copula), Sarraméa, 24–25 Dec. 1991, M. E. Irwin, D. W. Webb, malaise trap across forest opening; 1 ♂, trail to Mt. Panié, 22 km NW Hienghène, 11 Nov. 1992, D. W. Webb, E. & M. Schlinger, malaise trap in tropical rainforest, 457 m (DAVIS, ILLINOIS). This species was collected in November and December.

Etymology.—The species is named in honor of the collector, Michael E. Irwin.

Discussion.—Males of both *irwini* and *nigra* share the oddly keeled metasomal sternum I, and both are black with pale markings. However, *irwini* can be immediately distinguished by the presence of a midcoxal spine and fully developed mesopleural lamellae. The shape of the aedeagus is also unique to *irwini*.

Eirone koghisica Kimsey, new species
(Fig. 2, 25)

Male.—Body length 11–13 mm; forewing length 10–11 mm; face (Fig. 2), punc-

tures widely separated on frons and vertex, 2–4 PD apart, becoming smaller and denser toward inner eye margin, tiny and contiguous between inner eye margin and antennal socket; clypeal punctures contiguous and somewhat striatiform medially; clypeal apex slightly flared anteriorly, slightly depressed medially when viewed in profile, apex weakly trilobate and 3 MOD wide between outer lobes; F-I length 2× breadth; F-II length 2.3× breadth; pronotal and scutal punctures sparse and 2–4 PD apart medially, becoming smaller and denser laterally, contiguous to 0.5 PD apart; mesopleural punctures 0.5–1.0 PD apart; scutellum impunctate basally, becoming punctate posterolaterally, punctures 0.5–1.0 PD apart; propodeum finely shagreened, punctures 0.5–1.0 PD apart, with impunctate sublateral area; midcoxal spine present; abdominal segments finely shagreened, with scattered punctures 2–4 PD apart; metasomal sternum I with medial keel extending three-fourths of total length, abruptly declivitous posteriorly; epipygium with narrowly rounded apex; hypopygium with narrowly rounded apex; genital capsule (Fig. 25): gonocoxa with submedial welt or swelling on inner surface; aedeagus apical column bending dorsally, with apex broadened; penis valve with large dorsal hook; volsella dorsally broadened and subrectangular, ventrally with brief row of dense short setae or spines. Body black, with pale yellow or cream-colored markings on lower three quarters of inner and outer eye margins, antennal lobes, transverse band on lower face from mandibular bases across clypeus, mandibular base, transverse band along anterior pronotal carina broken medially, arc on posterior lobe of pronotum near tegula, basally on tegula, scutum at posterolaterally, metanotum medially; wing membrane brown becoming darker in medial cell, with brown veins; vestiture silvery on head and thorax, black on metasoma.

Female.—Unknown.

Type material.—Holotype ♂: NEW CAL-EDONIA, Prov. Sud, Mt Koghis, 17 km nne Nouméa, malaise across path in rain-forest, 425m, 8–10 Jan. 1996, M. E. Irwin, D. W. Webb, E. I. Schlinger, 22°10'34"S 166°30'17"E (PARIS). Paratypes: 6 ♂♂, 2 ♂♂, Rivière Bleue Prov. Pk., trail to Upper Rivière Bleue, 19–28 Nov. 1992, 305 m, D. W. Webb; Rivière Bleue Prov. Pk., km 21.9 Rivière Bleue road, Nov. 1992, 290 m, M. E. Irwin, D. W. Webb; 2 ♂♂, same as previous, except, 5–16 Nov. 1992, 290 m, D. W. Webb; 1 ♂, Rivière Bleue Prov. Pk., trail to Vallée de Pourina, 19–28 Nov. 1992, 850 m, D. W. Webb; 1 ♂, Mt Koghis, 17 km nne Nouméa 5–15 Nov. 1992, D. W. Webb (DAVIS, ILLINOIS). This species was collected in November and early January.

Etymology.—This species is named after the collection site on Mt. Koghis.

Discussion.—*Eirone koghistica* most closely resembles *laniensis*, based on the apically convex clypeus, shallowly convex metasomal sternum I, presence of a midcoxal spine and well-developed mesopleural lamella. Both species are basically black with yellow to whitish markings. However, *koghistica* can be distinguished from *laniensis* by the trilobate clypeus, and apically rounded or truncate epipygium.

***Eirone laniensis* Baptiste, new species**
(Figs. 3, 20, 26)

Male.—Body length 10–16 mm; forewing length 9–13 mm; face (Fig. 3); punctation as in *koghistica*, except clypeal punctures 1–2 PD apart; clypeal apex gently convex medially and 2.5 MOD wide; F-I length 2.3× breadth; F-II length 3.6× breadth; midcoxal spine present; metasomal sternum I with medial longitudinal carina extending about halfway from anterior edge; epipygium with narrowly truncate bilobate apex, medially depressed subapically, with long setae arising from margins, strongly flattened in profile; hypopygium narrowly rounded apically and flattened in profile, with

short, stout fringe of setae along apex (Fig. 20); genital capsule (Fig. 26): gonocoxa with subapical ridge; aedeagus with apical column slender and elongate, extending two-thirds length of gonocoxa, bending dorsally; penis valve appearing strongly trilobate, with long dorsal hook; volsella strongly bilobate dorsally, ventrally with densely setose surface. Head black, with yellow or cream-colored markings on antennal lobes, lower half of clypeus, inner and outer eye margins, spot behind eye, base of mandible; pronotal band on anterior carina, on pronotal lobe near tegula; mesopleuron black, with yellow spot below tegula; scutum black with yellow spot basally on tegula; scutellum and metanotum with yellow markings medially and on anterolateral edge; propodeum with posterior yellow submedial spots; legs orange, except coxae black with yellow-orange ventral markings ventrally; metasoma orange, with black markings basally and apically on T-I, apically on metasomal sternum II and T-V, T-VI, metasomal sternum I, S-V and S-VI entirely black; wing membrane light brown with dark brown veins; vestiture silvery on head and thorax, orange on metasomal except black in specimens from Mt. Koghis and Mt. Dzumac.

Female.—Unknown.

Type material.—Holotype ♂: NEW CAL-EDONIA, Upper La Ni Valley, 2–17 Nov. 1992, D. W. Webb, 103 m, malaise trap across logging road (PARIS). Paratypes 42 ♂♂, 34 ♂♂, same data as holotype; 2 ♂♂, Rivière Bleue Prov. Pk., trail to Vallée de Pourina, 19–28 Nov. 1992, 850 m, D. W. Webb, malaise trap across forest path; 1 ♂, Rivière Bleue Prov. Pk., km 25.8, Rivière Bleue road, 30 Oct – 3 Nov. 1992, 213 m, M. E. Irwin, D. W. Webb; 2 ♂♂, Mt. Koghis, 500 m, 17 km nne Nouméa, 5–15 Nov. 1992, D. W. Webb; 1 ♂, Mt. Koghis, 500 m, 17 km nne Nouméa, 1–3 Nov. 1992, M. E. Irwin, D. W. Webb, malaise trap in tropical forest; 1 ♂, Mt. Koghis, 800 m, 1–6 Sept. 1972, J. F. McAlpine; 1 ♂, Mt. Dzu-

mac, 900 m, 166°28'E 22°1'45"S, 1–10 Nov. 1986, R. L. Brown, Malaise trap (DAVIS, ILLINOIS, OTTAWA). This species was collected in November.

Etymology.—*Eirone laniensis* is named after the collection site in the La Ni Valley.

Discussion.—*Eirone laniensis* most closely resembles *koghisica* as discussed under that species. Additional diagnostic features include the presence of a midcoxal spine, apically convex clypeal margin and well-developed mesopleural lamella. Specimens from Mt. Koghis and Mt. Dzumac tend to be darker, with more black coloration than the rest. However, structurally they appear to be the same as the rest of the paratypes.

***Eirone maigretae* Baptiste, new species**
(Figs. 4, 10, 21, 27)

Male.—Body length 18–21 mm; forewing length 14–16 mm; face (Fig. 4) punctures tiny between antennal lobes and inner eye margins, contiguous to 0.5 PD apart, becoming slightly larger and less dense, 0.5–1.0 PD apart on frons and vertex; clypeus medially gently convex, apical truncation 2.2–2.3 MOD wide, punctures small and 0.5–1.0 PD apart medially; F-I 2.2×; F-II length 3.2× breadth; pronotal punctures tiny and 2–4 PD apart; scutal punctures tiny and nearly contiguous laterally, becoming 0.5–2 PD apart laterally; mesopleural punctures 0.5–2.0 PD apart; mesopleural lamella apically rounded and flat against body; scutellum punctate medially and submedially, punctures 1–2 PD apart; propodeum finely and densely shagreened, punctures 1–2 PD apart, impunctate laterally; abdominal segments finely shagreened, punctures tiny and 4–6 PD apart; metasomal sternum I with medial longitudinal keel extending about halfway from anterior edge, sloping obliquely to posterior margin; epipygium strongly convex in profile, apex rounded (Fig. 21); hypopygium with broadly rounded apex; genital capsule (Fig. 27): gonocoxa with at most an obsolescent ridge on inner sur-

face; aedeagus apical column elongate, sinuous, and slender, bending ventrally; penis valve with large, slender dorsal hook and ventral lobe strongly expanded apically; volsella dorsally large and fist-like with small subsidiary lobe with 3–5 long apical setae, ventrally with curved digitate lobe margined by erect, long, somewhat curly setae, apical margin with short erect setae. Head yellow, with black markings, except orange on pedicel, ventral surface of scape and apical rim of clypeus, on frons back to occiput, diagonal bands extending from upper posterior eye margins to occiput, flagellomeres and dorsal surface of scape, mandibular apex; pronotum yellow, with black markings anteriorly, submedially behind anterior carina to lateral area, posterior margin transparent and orange-tinted; mesopleuron orange, with black markings along upper anterior edge to wing fossa; scutum black, except anteromedially orange, with posterior submedial yellow longitudinal bands; scutellum black, with yellow submedially; metanotum black with yellow band medially; propodeum orange with black submedially, and medial longitudinal yellow band; legs orange, with black dorsally on the coxae, trochanters and femora; metasoma orange, with black on posterolateral area of T-I and on hypopygium; wing membrane brown, darkest apically, with dark brown-black veins; vestiture silvery to pale yellow on head and thorax, orange on metasoma.

Female.—Unknown.

Type material.—Holotype ♂: NEW CALLEDONIA, trail to Mt. Panié, 22 km NW Hienghène, 11–25 Nov. 1992, D. W. Webb, E. & M. Schlinger, malaise trap, in tropical forest, 457 m (PARIS). Paratypes 28 ♂♂: 19 ♂♂, same data as holotype; 6 ♂, same as holotype, except, 11 Nov. 1992, E. & M. Schlinger, 238–548 m; 1 ♂, Mt. Koghis, 500 m, 17 km nne Nouméa, 3–4 Nov. 1992, M. E. Irwin, D. W. Webb, E. & M. Schlinger; 1 ♂, Mt. Koghis, 500 m, 17 km nne Nouméa, 24–26 Dec. 1991, M. E. Irwin, D. W.

Webb; 1 ♂, Mt. Panié, 250–350 m, 30 Oct. 1986, R. L. Brown, sweeping; (DAVIS, ILLINOIS, OTTAWA). This species was collected from late October into late December.

Etymology.—This species of *Eirone* is named after Carolyn S. Maigret.

Discussion.—*Eirone maigretae* can be distinguished from the other species lacking a midcoxal spine as discussed under *emarginata* and *webbi*.

***Eirone nasalis* Kimsey, new species**
(Figs. 7, 12, 28)

Male.—Body length 15–19 mm; forewing length 10–14 mm; face (Fig. 7) lower facial punctures tiny and nearly contiguous, except upper clypeal margin nearly impunctate; clypeus projecting subapically, with well-developed, horizontally oriented ventral bevel, apex medially forming anteriorly projecting knob, with long pale setae, strongly nasiform in profile; frons punctures larger and 0.5–1.0 PD apart, except nearly impunctate medially below midocellus; vertex punctures 0.5–1.0 PD apart; F-I length 2.7× breadth; F-II length 2.8× breadth; pronotal and scutal punctures 0.5–1.0 PD apart, becoming sparsest medially; mesopleural punctures 0.5 PD apart; scutellar punctures 1 PD apart laterally, becoming sparser medially; midcoxal spine present; propodeum primarily punctate, punctures 0.5–1.0 PD apart, except anterolaterally impunctate; abdominal segments finely shagreened, punctures irregularly spaced, 2–6 PD apart; metasomal sternum I with medial keel along entire length and abruptly declivous posteriorly (Fig. 12); epipygium with medial depression, apex bilobate, flattened in profile; hypopygium subrectangular, slightly narrowed and subtruncate apically; genital capsule (Fig. 28); gonocoxa with subapical ridge on inner surface and large subbasal lobe on dorsal margin connected to setose medial lobe on inner surface; aedeagus apical column elongate, extending more than two-thirds

length of gonocoxa, sharply angled ventrally, apex broadly elongate triangular; penis valve with slender and elongate dorsal hook and ventral lobe; volsella broadly truncate dorsally, ventral surface with row of erect curved setae. Black, with cream-colored or light yellow band along inner and outer eye margins; wing membrane light brown with brown veins; vestiture silvery on head, thorax and metasomal basal segments, black on apical segments.

Female.—Unknown.

Type material.—Holotype ♂: NEW CALEDONIA, trail to Mt. Panié, 22 km NW Hienghène, 11–25 Nov. 1992, D. W. Webb, E. & M. Schlinger, malaise trap in tropical forest, 600 m (PARIS). Paratypes 39 ♂♂, 25 ♂♂, same data as holotype, except 457 m; 6 ♂♂, same data as holotype, except 457 m and 11 Nov. 1992; 4 ♂♂, Mt. Mandjanié, 5.3 km wsw Pouébo, 9–26 Nov. 1992, D. W. Webb, 550 m, malaise trap in tropical forest (DAVIS, ILLINOIS). This species was collected in November.

Etymology.—The species name refers to the nose-like projection of the clypeus.

Discussion.—This species can be immediately recognized by the projecting nose-like clypeus. Additional diagnostic features include the large rounded mesopleural lamella, presence of a midcoxal spine and black body color.

***Eirone neocaledonica* Williams**
(Figs. 17, 29)

Eirone neocaledonica Williams 1945:415. Holotype ♂: New Caledonia: Thi River Valley near St. Louis (WASHINGTON), examined.

Male.—Body length 9–11 mm; forewing length 7–9 mm; face with tiny contiguous punctures between inner eye margins and antennal sockets; frons nearly impunctate, with punctures widely separated, particularly along medial sulcus; clypeus with punctures much larger than along inner eye margin, punctures 0.5–1.0 PD apart, but obscured by fine shagreening; clypeal apex narrowly truncate, truncation 2.2

MOD wide; F-I length $2.2\times$ breadth; F-II length $3\times$ breadth; pronotum almost impunctate with few scattered lateral punctures; mesopleural punctures 0.5–1.5 PD apart, with dense, fine shagreening between; mesopleural lamella rounded posteriorly; scutal punctures medially 3–5 PD apart, becoming finer and denser laterally, 1–2 PD apart; scutellum nearly impunctate medially, laterally punctures 1–2 PD apart, with dense, fine shagreening; propodeum laterally with large tubercle, nearly impunctate except small medial patch of punctures (2–5 PD apart) and laterally below tubercle punctures smaller and 0.5–1.0 PD apart; midcoxal spine present; metasomal sternum I strongly triangular in profile, sloping abruptly to posterior margin; epipygium convex with two large digitate apicolateral lobes; hypopygium flat and broadly angulate apically; genital capsule (Fig. 29): gonocoxa with medial swelling associated with tuft of long setae on inner surface; aedeagus apical column elongate, slender and sinuous, bending ventrally; penis valve with broad dorsal lobe and broad, wing-like apical lobe; volsella with broad dorsal lobe, setose medial lobe and asetose ventral surface; color: black; wing membrane untinted basally, brown-tinted apically, particularly in marginal cell of forewing; pubescence on head and thorax silvery, on metasoma black.

Material examined.—3 males (including the holotype): 9.1 km NW Sarraméa, Thi River Valley, and Mt. Koghis (17 km nne Nouméa) (HONOLULU, URBANA, WASHINGTON). This species was collected in the months of December and January.

Discussion.—*Eirone neocaledonica* is one of the most unusually modified species and does not resemble any other in the genus. It can be immediately recognized in the male by the bidigitate epipygium, tuberculate propodeum and mesopleuron and truncate clypeal apex.

Eirone nepouiensis Baptiste, new species
(Figs. 10, 13, 30)

Male.—Body length 10–14 mm; forewing length 9–11 mm; clypeal punctures discrete and nearly touching; clypeal apex bilobate in ventral view, apical bevel nearly horizontal in profile, apical truncation 2.8 MOD wide; punctures along lower inner eye margin tiny and contiguous; frons punctures much larger and 0.5–2 PD apart; vertex punctures 0.5–1.0 PD apart; F-I length $2.0\text{--}2.1\times$ breadth; F-II length $2.4\text{--}2.5\times$ breadth; pronotal punctation 1–4 PD apart, except nearly impunctate medially; scutal punctures 0.5 PD apart anteriorly and laterally, becoming 1–3 PD apart medially; scutellar punctures contiguous laterally, 2–3 PD apart medially; mesopleural punctation 1–3 PD apart, becoming much finer and denser near metapleural suture; propodeal punctures 1–2 PD apart, becoming impunctate sublaterally; metasomal punctures 2–4 PD apart; midcoxal spine present (Fig. 10); metasomal sternum I with medial carina extending one-third to one-half distance from anterior edge, obliquely sloping to posterior margin (Fig. 13); epipygium broadly rounded apically, medially depressed; hypopygium with bluntly rounded apex; genital capsule (Fig. 30): gonocoxa broad, inner surface without distinct ridges or lobes; aedeagus apical column slender, short, extending only slightly beyond penis valve; penis valve with broad, wing-like apical and basal lobes, dorsal lobe broadly rounded and hooked apically; volsella with bilobate and hooked dorsal surface, ventrally asetose and abbreviated; color black, with yellow markings on antennal lobes, clypeus except distal edge, inner and outer eye margins, basal two-thirds of mandibles, across anterior pronotal carina (broken medially) and near dorsolateral apex, pronotal lobe, basal edge of tegula, band submedially on scutum, spot on scutellum anterolaterally and posterolaterally, metanotum submedially

and at hind wing base attachment, mesopleuron with spot below tegula, forefemur anteriorly; propodeum posterolaterally; T-I-III with lateral spots; wing membrane brown, with dark brown veins; vestiture brownish on head and thorax, black on metasoma.

Female.—unknown.

Type material.—Holotype ♂ (right antennal flagellomeres 2–3 missing, flagellomeres IV–XI mounted on point below specimen): Presqu'île de Pindai, 6 km sw Népoui, 25 Dec. 1991, M. E. Irwin (PARIS). Paratypes, 2 ♂♂, Plage de Pindai, 6 km sw Népoui, 7–13 Nov. 1992, D. W. Webb, malaise trap in coastal dunes area (DAVIS, ILLINOIS). Specimens were collected in November.

Etymology.—This species is named after the collection site on Népoui.

Discussion.—The flattened metasomal sternum I, emarginate mesopleural lamella, midcoxal spine and black coloration are characteristics shared by *nepouiensis* and *transversa*. However, *nepouiensis* can be distinguished from *transversa* by the ventrally bilobate clypeus and nearly horizontal clypeal bevel.

Eirone nigra Brown

(Figs. 11, 31)

Eirone nigra Brown 1984:257. Holotype ♂: New Caledonia: Hienghène (HONOLULU), examined.

Male.—Body length 13 mm; forewing length 11 mm; face with tiny contiguous punctures between inner eye margins and antennal sockets; frons impunctate around medial sulcus, laterally punctures 0.5–1.0 PD apart; clypeus with punctures larger than along inner eye margin, punctures 0.5–1.0 PD apart; clypeus convex medially, apex narrowly truncate, truncation 1.2 MOD; F-I length twice breadth; F-II length 2.8× breadth; pronotal punctures 1–3 PD apart; mesopleural punctures 1–2 PD apart; mesopleural lamella short, apically emarginate; scutal punctures sparsest me-

dially (1–3 PD apart), becoming finer and denser laterally (0.5–1.0 PD apart); scutellum impunctate medially, denser laterally, lateral punctures 0.5–1.0 PD apart; propodeum punctate in small medial patch (punctures 1–2 PD apart) and laterally (punctures 0.5–1.0 PD apart), impunctate sublaterally; midcoxa without apical spine; metasomal sternum I gently convex, with short medial carina extending about half length, sloping gently to posterior margin; epipygium strongly convex, apically subtruncate; hypopygium flat, broadly rounded apically; genital capsule (Fig. 31): gonocoxa with swelling above volsella on inner surface; aedeagus with slender apical column bending ventrally; penis valve with long dorsal hook, ventral lobe with long slender digitate apical lobe bending dorsally; volsella with large, broadly rounded dorsal lobe, ventrally with densely setose digitate lobe; color: black, wing membrane dark brown-tinted, veins black; pubescence on head and thorax silvery, metasoma black.

Material examined.—Only the holotype has been seen. It was collected in Hienghène in January.

Discussion.—The lack of a midcoxal spine and short mesopleural lamella suggests a close relationship between *nigra*, and *maigretae* and *emarginata*. However, the shorter F-I, clypeal truncation narrower than the transantennal distance and the black abdominal setae distinguish *nigra* from these two species.

Eirone obtusidens Turner

(Figs. 5, 32)

Eirone obtusidens Turner 1919:236. Holotype ♂: New Caledonia: Noumea (LONDON), examined.

Eirone obtusidens var. *superstes* Cockerell 1929: 239. Holotype ♂: New Caledonia: Bourail (WASHINGTON). Synonymized by Brown 1984.

Male.—Body length 13–14 mm; forewing length 11–12 mm; face with tiny contiguous punctures between inner eye mar-

gins and antennal sockets; frons with punctures 0.5–2 apart, except impunctate along medial sulcus and adjacent to antennal socket; clypeus with punctures larger than along inner eye margin, punctures contiguous; clypeal apex broadly triangular, with single apicomedial lobe; F-I length 2.4–2.5× breadth; F-II length 3.0–3.2× breadth; pronotal punctures 1–3 PD apart; mesopleural punctures 1–2 PD apart separated by dense, fine shagreening; mesopleural lamella posteriorly rounded; scutal punctures densest along notauli (nearly contiguous), medially sparsest (0.5–1 PD apart); scutellum nearly impunctate medially, punctures denser laterally, 0.5–1.0 PD apart; propodeum punctate medially and propodeum punctate medially and laterally, 0.5–1.0 PD apart; propodeum punctate medially and laterally, punctures 0.5–1.0 PD apart, impunctate sublaterally; metasomal sternum I sharply keeled, keel somewhat hooked posteriorly, abruptly declivous posteriorly; epipygium and hypopygium flattened and apex narrowly subtruncate; genital capsule (Fig. 32): gonocoxa with low medial angular lobe on inner surface; aedeagus elongate, apical column broad and flattened, bending dorsally, apically truncate, column extending more than half its length beyond penis valve; penis valve with short dorsal hook, large, rounded ventral lobe and elongate basal lobe; volsella with bilobate dorsal projection, apical lobe capitate and ventral surface slender with row of long setae.

Material examined.—7 ♂♂ (including the holotype of *obtusidens*), from Prov. Sud, 7.5 km NW and 1 km NW Sarraméa, Rivière Bleue, Mt. Panié, Noumea and Bourail. Specimens were collected in October, November and January.

Discussion.—The shape of the clypeus in *obtusidens* and *anone* is unique among the New Caledonian species. *Eirone obtusidens* can be distinguished from *anone* by the gently convex metasomal sternum I as discussed under that species.

Eirone paniensis Kimsey, new species
(Fig. 6, 33)

Male.—Body length 7–12 mm; forewing length 6–10 mm; face (Fig. 6) punctuation; clypeus shagreened, most punctures 1–2 PD apart, becoming sparser apically, inner eye margins with tiny, nearly contiguous punctures; frons with punctures 2–5 PD apart, impunctate medially; clypeus gently convex, apex broadly truncate, truncation 2 MOD wide; vertex punctures 2–5 PD apart; F-I length 2× breadth; F-II length 3× breadth; malar lobe subtending mandibular articulation tooth-like; pronotum impunctate and polished dorsally, side with punctures 1–2 PD apart; mesopleuron bulging and knob-like medially, punctures 0.5–2 PD apart, densest dorsally, mesopleural lamella broadly rounded apically and bending slightly ventrally; scutum strongly depressed posteriorly along notalices, finely shagreened, scutal punctures 0.5–5 PD apart, becoming nearly impunctate posteromedially; scutellar punctures 1–5 PD apart, nearly impunctate medially; propodeum finely shagreened and impunctate dorsally except for punctate medial band, strongly tuberculate sublaterally, becoming densely punctate laterally, punctures 0.5–2 PD apart; midcoxa with acute spine; metasomal sternum I broadly triangular in profile, sloping obliquely toward posterior margin, not medially carinate; epipygium broadly rounded apically, apical margin with slight medial indentation, convex in profile; hypopygium broadly rounded and spinose, with flattened apex; genital capsule (Fig. 33): gonocoxal inner surface smooth; aedeagus apical column slender, elongate and sinuous, extending more than two-thirds length of gonocoxa; penis valve with rounded dorsal and ventral lobes; volsella with large truncate and setose dorsal lobe, ventral surface with erect, dense row of setae. Body black, with pale yellow or cream-colored markings on mandibular base, lower half of clypeus,

along inner and outer eye margins, on antennal lobes, transverse band (broken medially and sublaterally) along anterior pronotal carina, spot on pronotal lobe, distal forecoxal spot and subalar spot on mesopleuron, spot on tegula and on scutellum laterally; wing membrane brown, becoming darkest on apical third, with black veins; vestiture silvery on head and thorax, black on metasoma.

Female.—Unknown.

Type material.—Holotype ♂: trail to Mt. Panié, 22 km NW Hienghène, 11–25 Nov. 1992, 600 m, tropical forest, malaise trap, D. W. Webb and E. & M. Schlinger (PARIS). Paratypes, 5 ♂♂, same data as holotype (DAVIS, ILLINOIS). All specimens were collected in November.

Etymology.—*Eirone paniensis* is named after the collection site, Mt. Panié.

Discussion.—Much like *neocaledonica*, *paniensis* has a prominent knob on either side of the propodeum and very similar aedeagus and penis valve. Both species are relatively small-bodied, 7–10 mm long, and black, with few pale markings. However, *paniensis* can be distinguished from *neocaledonica* by the strongly tuberculate mesopleuron, gonocoxa with large interior brush of long setae, and tooth-like genal projection. In addition, *paniensis* has a midcoxal spine and well-developed mesopleural lamella

***Eirone rivierensis* Baptiste, new species**
(Figs. 15, 34)

Male.—Body length 8–14 mm; forewing length 9–12 mm; facial punctures 1–3 PD apart, except area between inner eye margin and antennal bases with tiny, nearly contiguous punctures, and narrow impunctate longitudinal band below midcellus; clypeus convex medially and apically truncate, apical truncation 2 MOD wide; F-I length 2× breadth; F-II length 3× breadth; pronotal punctures 1–3 PD apart; mesopleuron projecting medially, integument shagreened, with punctures 1–2 PD apart, becoming denser dorsally;

mesopleural lamella rounded apically and bending ventrally; scutum punctate and shagreened laterally, punctures 0.5–1 PD apart, becoming sparsely punctate medially with punctures 1–3 PD apart; scutellum laterally punctate, punctures 0.5–1 PD apart, medially polished and impunctate; propodeum finely shagreened, with punctures 1–2 PD apart, except laterally 0.5–1 PD apart, sublaterally impunctate; midcoxal spine present; metasomal sternum I broadly triangular in lateral view, sloping obliquely posteriorly (Fig. 15); epipygium narrowly rounded apically, flattened in profile; hypopygium with narrowly rounded apex, apical rim medially thickened and spinose; genital capsule (Fig. 34): gonocoxa with angulate ridge subapically on inner surface; aedeagus with apical column flattened and becoming broadly subtriangular apically; penis valve small with sharply hooked dorsal and ventral lobes, occupying half or less the distance across genital capsule; volsella dorsally fist-like, ventral half forming a long flat surface with row of dense, stout setae. Body black, with light yellow or cream-colored markings on clypeus above apical margin, along lower two-thirds of inner and outer eye margins, antennal lobes, band along pronotal transverse anterior carina (broken medially), band anterolaterally and posterior lobe of pronotum; wing membrane brown, with brown veins; vestiture silvery on head and thorax, metasomal terga I–VII with long, erect black setae along posterior margin that are densest on VII; sternum II–VI with long, erect black setae along posterior margin.

Female.—Unknown.

Type material.—Holotype ♂ (left antennal flagellomeres II–XIII missing): Rivière Bleue Prov. Pk., 19–20 Nov. 1992, 213 m, D. W. Webb & E. and M. Schlinger (PARIS). Paratypes 9 ♂♂, 1 ♂, Rivière Bleue Prov. Pk., km 25.8 Rivière Bleue road, 5–16 Nov. 1992, 213 m, D. W. Webb, E. & M. Schlinger; 1 ♂♂, *ibid.*, except, 30 Oct.–3 Nov., M. E. Irwin, D. W. Webb; 2 ♂♂,

ibid., except, km 19.6, 18–20 Nov. 1992, D. W. Webb; 2 ♂♂, ibid., except, km 21.9, 20–28 Nov. 1992, M. E. Irwin, D. W. Webb; 1 ♂, 30 km NW Yaté, 550 m, 27–28 December 1991, M. E. Irwin, D. W. Webb; 1 ♂, Rivière Bleue Prov. Pk., trail to upper Rivière Bleue, 5–16 Nov. 1992, 290 m, D. W. Webb; 1 ♂, Rivière Bleue Prov. Pk., trail to Vallée de Pourina, 19–28 Nov. 1992, 850 m, D. W. Webb; (DAVIS, ILLINOIS). This species was collected in November and December.

Etymology.—This species is named after the collection site in Rivière Bleue Province.

Discussion.—This species can be recognized by the primarily black coloration, without any reddish coloration, presence of a midcoxal spine, rounded mesopleural lamellae and truncate clypeal margin. *E. rivierensis* is most similar to *colorata* but can be separated by the dense black tuft of setae protruding from T-VI and VII. This tuft of setae is absent in *colorata*.

***Eirone salteri* Brown**
(Figs. 16, 18, 35)

Eirone salteri Brown 1984:250. Holotype ♂: New Caledonia: St. Louis "Val" (HONOLULU), examined.

Male.—Body length 12–14 mm; forewing length 10–12 mm; face with tiny, contiguous punctures between inner eye margins and antennal sockets; frons with punctures 0.5–1.0 apart, except nearly impunctate medially; clypeus subapically concave, apex narrowly produced into two lobes, 1.2–1.4 MOD apart, surface finely shagreened, punctures much larger than along inner eye margin, 0.5–1.0 PD apart; F-I length 2.2–2.3× breadth; F-II length 3.2–3.4× breadth; pronotal punctures 0.5–1.0 PD apart; mesopleural punctures 0.5–1.0 PD apart; mesopleural lamella short, apically truncate; scutal punctation medially 1–2 PD apart, becoming finer and denser laterally, 0.5–1.0 PD apart; scutellar medial punctures 2–4 PD

apart, laterally 1–2 PD apart; propodeum with oblique sublateral swelling, punctures medially 1–3 PD apart, laterally contiguous to 0.5 PD apart, impunctate sublaterally; midcoxa with short apical tooth; meso-, metathorax and propodeum finely and densely shagreened between punctures; metasomal sternum I with sharp, posteriorly hooked, medial keel, overhanging metasomal sternum II; epipygium strongly convex, apically narrowed and truncate; hypopygium flat, apically narrowed and bilobate; genital capsule (Fig. 35): gonocoxa inner surface smooth, without distinct ridges or lobes; aedeagus with apical column elongate, slender and sinuous, bending ventrally; penis valve large, dorsal lobe with blunt hook, ventral lobe large and wing-like, extending apically; volsella with long curly setae along apical surface, dorsally large and capitate, ventrally with large flat lobe tipped by two long setae; color black, with whitish markings on antennal lobes, inner and outer eye margins, mandible base, clypeus, transverse anterior pronotal margin, pronotum adjacent to tegula, mesopleuron below tegula, scutellum with two lateral spots; metanotum medially; legs orange; wing veins orange, except stigma black; wing membrane dark yellow-tinted, apex often browner; vestiture on head and thorax silvery to yellowish, on metanotum brown to black.

Material examined.—4 ♂♂ (including holotype): Sarraméa, St. Louis Val, and 1 km n and 9.1 km NW Sarraméa. All specimens were collected in late December, January and February (DAVIS, HONOLULU, URBANA).

Discussion.—Diagnostic features of *salteri* include the presence of a midcoxal spine, mesopleural lamella short and sharply emarginate, keel-like metasomal sternum I overhanging metasomal sternum II, apically bilobate clypeus, bilobate epipygium and amber-colored wing membrane. Metasomal sternum I is the same odd shape as seen in *irwini*, but the other

features given above will immediately separate the two.

***Eirone subtuberculata* Brown**
(Fig. 36)

Eirone subtuberculata Brown 1984:253. Holotype ♂: New Caledonia: Mts. de Koghis (HONOLULU), examined.

Male.—Body length 15–17 mm; forewing length 11–14 mm; face with tiny contiguous punctures between inner eye margins and antennal sockets; frons with punctures contiguous to 0.5 PD apart, except impunctate along medial sulcus; clypeus produced into subapical knob, with punctures larger than along inner eye margin, punctures contiguous and shagreened; clypeal apex truncate, truncation 3.0–3.2 MOD across; F-I length 2.2–2.3× breadth; F-II length 3× breadth; pronotal punctures 1–3 PD apart; mesopleural punctures 0.5–1.0 PD apart, shagreened between punctures; mesopleural lamella posteriorly triangular to rounded; scutal punctures medially 0.5–1.0 PD apart, becoming finer and denser laterally, contiguous to 0.5 PD apart; scutellar punctures 2–3 PD apart, laterally 0.5–1.0 PD apart; propodeum punctures 1–2 PD apart except anterolaterally, impunctate and finely shagreened; midcoxa with short apical tooth; metasomal sternum I strongly produced into slightly hooked keel, sloping vertically to sternum II; epipygium flattened, apically broadly bilobate; hypopygium flat, broadly truncate apically, with slight medial emargination; genital capsule (Fig. 36): gonocoxa with large submedial swelling on inner surface and subbasal lobe on ventral margin; aedeagus apical column elongate, about two-thirds as long as gonocoxa, apically curved, expanded and lanceolate; penis valve with slender dorsal and ventral, apically hooked lobes, barely obscuring aedeagal base; volsella with broad dorsal lobe and slender obsolescent ventral surface, with short erect setae along apical margin; color

black, with occasional small faint pale mark on inner and outer eye margin; wing membrane brown-tinted, veins black; vestiture of head and thorax silvery, metasomal brown to black.

Material studied.—13 ♂♂: Mt. Koghis; 17 km nne Nouméa (DAVIS, URBANA, HONOLULU). All specimens were collected in the months of December, January and February.

Discussion.—*Eirone subtuberculata* appears to be most similar to *rivierensis* and *colorata* based on the presence of a midcoxal spine, emarginate mesopleural lamella, apically truncate epipygium and thin clypeal apical margin. However, it is much larger than these two species, ranging from 12–16 mm long. The metasomal sternum I of *subtuberculata* differs as well resembling that of *nasalis* with an abruptly declivous posterior margin.

***Eirone transversa* Brown**
(Fig. 37)

Eirone transversa Brown 1984:254. Holotype ♂: New Caledonia: Mts. de Koghis (HONOLULU), examined.

Male.—Body length 10–15 mm; forewing length 8–12 mm; face with tiny contiguous punctures between inner eye margins and antennal sockets; frons with punctures 1–2 PD apart, except impunctate along medial sulcus; clypeus slightly convex, with transverse subapical bevel, punctures larger than along inner eye margin, 0.5–1.0 PD apart, shagreened between; clypeal apex truncate, truncation 2.0–2.2 MOD wide; F-I length 2.1–2.2× breadth; F-II length 2.5–2.6× breadth; pronotal punctures tiny, 1–4 PD apart; mesopleural punctures 0.5–1.0 PD apart, finely shagreened between; mesopleural lamella short, apically emarginate; scutal punctures medially 1–2 PD apart, becoming finer and denser laterally along notauli, contiguous to 1 PD apart; scutellum nearly impunctate medially, lateral punctures 1–2 PD apart; propodeum punctate

medially and laterally, punctures 2–4 PD apart, impunctate anterolaterally and finely shagreened; midcoxa with apical spine; metasomal sternum I broadly convex, with short basal carina, sloping gradually to posterior margin; epipygium strongly convex, apex slightly bilobate or emarginate; hypopygium flat, with broadly rounded apex; genital capsule (Fig. 37): gonocoxa narrowed medially, inner surface relatively smooth without discrete ridges or lobes; aedeagus with slender and elongate apical column, reaching to apical third of gonocoxal, apical column medially arcuate, extending apically, not bending dorsally or ventrally; penis valve dorsal and ventral lobes broadly rounded without apical hook; volsella dorsally bilobate with long erect setae along apical margin, ventral surface with row of elongate erect setae; color black, with yellowish markings on antennal lobes, apical clypeal margin, mandibular base, spot on inner and outer eye margin, pronotum with medially broken transverse anterior band, pronotal angle adjacent to tegula, tegula, small anterolateral scutellar spot; wing membrane brown-tinted, veins black; pubescence of head and thorax silvery, metasoma black.

Female.—Body length 7–8 mm; body coarsely punctate, with fine, dense longitudinal striae; facial punctures large and somewhat striatiform; frons with obscure medial longitudinal groove; F-I as long as broad; F-II length 1.2× breadth; clypeal apex truncate; pronotum rounded laterally; propodeum impunctate laterally, elongate with flattened dorsal surface and lateral edges rounded, not carinate; T-I continuous with II, not constricted posteriorly; metasomal sternum I with strongly projection medial keel, appearing sharply triangular in profile.

Material studied.—91 ♂♂, 1 ♀: Mt. Koghis; 17 km nne Nouméa; Rivière Bleue Prov. Pk., 9–10 km NW Sarraméa; 13 km se Kaala-Gomé; trail to Mt. Panié, 22 km NW Hienghène; Rivière Bleue Prov. Pk.

Rivière Bleue Road, km 21 and 26; Rivière Bleue Prov. Pk., 30 and 36 km NW Yaté; Rivière Bleue Prov. Pk., trail to Vallée de Pourina; Rivière Bleue Prov Pk., trail to Upper Rivière Bleue (DAVIS, ILLINOIS). Specimens were collected in the months of October through January.

Discussion.—Most similar to *nepouiensis*, as discussed under that species, *transversa* can be distinguished from *nepouiensis* by the clypeal apex broadly rounded in ventral view and the apical clypeal bevel oblique when viewed in profile.

Eirone webbi Kimsey, new species (Figs. 8, 38)

Male.—Body length 8–13 mm; forewing length 7–11 mm; facial punctures tiny, contiguous to 1 PD apart across lower face, frons and vertex essentially impunctate and shiny; clypeus gently convex, apex narrowly truncate, truncation 2.1–2.3 MOD wide; F-I length 2× breadth; F-II length 3× breadth; pronotum highly polished and nearly impunctate, except laterally with scattered tiny punctures; mesopleural punctation consisting of small punctures about 1 PD apart, becoming nearly impunctate ventrally; mesopleural lamellae acute, strongly narrowed apically and bending somewhat ventrally (Fig. 8); scutum highly polished, punctures 2–8 PD apart; scutellum with punctures 1–5 PD apart, densest laterally; propodeum essentially impunctate, densely and finely shagreened; metasomal sternum I with short medial carina forming obtuse angle in profile; epipygium with narrowly rounded apex; hypopygium broadly rounded, with narrow, thickened spine-rimmed apical margin; genital capsule (Fig. 38): paramere with smooth inner surface; aedeagus with short apical column; penis valve with rounded dorsal lobe, ventral lobe short and apically hooked; volsella with large truncate dorsal lobe, setose medial lobe and ventral surface asetose. Body black, with pale yellow or cream-colored markings on mandibular bases, clypeus,

inner and outer eye margins, antennal lobe, pronotum with transverse band on anterior carina and narrow band on posterior lobe, mesopleuron with small subalar spot, tegula with small spot, scutellum with lateral spot, metanotum with medial spot, propodeum with postero-medial and small lateral spots (faint in holotype); wing membrane brown with black veins; vestiture sparse, silvery to yellowish on head and thorax, brown to black on metasoma.

Female.—Body length 5–6 mm; frons with medial longitudinal irregular groove extending two-thirds head length; head, thorax and abdomen covered with fine dense longitudinal striae; clypeal margin medially concave and broadly truncate; F-I length $1\times$ breadth; F-II length $1.3\times$ breadth; pronotum subquadrate, slightly narrowed anteriorly, dorsally impunctate except for irregular row of punctures extending medially and continuing across scutellum and propodeum; propodeum long and flattened, lateral edge rounded, not carinate, impunctate medially, with punctures clustered along margins; T-I nodose, strongly constricted posteriorly; metasomal sternum I shallowly convex, without distinct medial keel or carina; tergal punctures sparse and somewhat striatiform; T-VI with elevated longitudinal medial impunctate welt; body dark brown with pale setae.

Type material.—Holotype δ : NEW CALEDONIA, Rivière Bleue Prov. Pk., trail to Upper Rivière Bleue, 5–16 Nov 1992, 290 m, D. W. Webb, malaise trap across forest path (PARIS). Paratypes, 57 $\delta\delta$, 11 $\delta\delta$, same data as holotype; 2 $\delta\delta$, *ibid.*, except 3–5 Nov. 1992; 5 $\delta\delta$, *ibid.*, except 19–20 Dec. 1992; 1 δ , Rivière Bleue Prov. Pk., km 19.6 Rivière Bleue rd., 20–28 Nov. 1992, 183 m, D. W. Webb; 1 δ , Rivière Bleue Prov. Pk., km 25.8 Rivière Bleue rd., 17 Nov. 1992, 213 m, D. W. Webb, E & M. Schlinger; 1 δ , *ibid.*, except 19–20 Nov. 1992; 6 $\delta\delta$, Mt. Mandjanié, 5.3 km wsw Pouébo, 9–26 Nov 1992, D. W. Webb, 550

m, malaise trap in tropical forest; 2 $\delta\delta$, 1 δ , Rivière Bleue Prov. Pk., 30 km NW Yaté, 270 m, 27 Dec. 1991, M. E. Irwin, D. W. Webb; 1 δ , *ibid.*, except 36 km NW Yaté, 21 Dec. 1991, M. E. Irwin, D. W. Webb; 5 $\delta\delta$, Rivière Bleue Prov. Pk., trail to Vallée de Pourina, 19–28 Nov. 1992, 850 m, D. W. Webb; 19 $\delta\delta$, 1 δ , trail to Mt. Panié, 22 km NW Hienghène, 11–25 Nov. 1992, D. W. Webb, E. & M. Schlinger; 1 δ , same as previous location, except 11 Nov. 1992; 1 δ , Mt. Do, 14 km ne Bouloupari, 31 Oct.–4 Nov. 1992, M. E. Irwin, D. W. Webb, E. & M. Schlinger, 1000 m; 1 δ , Mt. Panié, 250–350 ft., 30 Oct. 1986, R. L. Brown; 1 δ , Rivière Bleue, 166°39.55'E 22°6'S, 18 Oct. 1986, R. L. Brown (DAVIS, ILLINOIS). Specimens were collected in the months of October and November.

Other material examined.—1 δ , Rivière Bleue Prov. Pk., trail to Vallée de Pourina, 19–28 Nov. 1992, 850 m, D. W. Webb; 1 δ , same as above, except trail to Upper Riv. Bleue, 16–19 Nov. 1992, 290 m.

Etymology.—This species is named after the collector, Donald W. Webb.

Discussion.—Most individuals of this species are entirely black. However, some are orange or have varying amounts of black and orange coloration. *Eirone webbi* is one of the New Caledonian species lacking a midcoxal spine, the others being *impunctata*, *emarginata*, *nigra* and *maigretae*. Unlike these species, *webbi* can be distinguished by the strongly apically narrowed and flattened epipygium and hypopygium. The epipygium is slightly indented apicomediaally and not broadly rounded as in the other species. In *webbi* the clypeal apex is broadly truncate, and the truncation has blunt lateral corners. In *maigretae* and even more so in *emarginata*, the corners are acute, and in *emarginata* the clypeus is apicomediaally emarginate. The epipygium in *maigretae*, *nigra* and *emarginata* is strongly convex in profile, not flattened as it is in *webbi*. *Eirone maigretae* and *emarginata* are considerably larger than *webbi*, ranging between 18 and 22 mm in length.

Although color and body size vary considerably in *webbi*, this species can be distinguished by the acute and ventrally pointed mesopleural lamella. In the few individuals where the lamellae have been broken off the narrowed and flattened epipygium and hypopygium and configuration of the clypeus will prove diagnostic.

E. impunctata is another species of *Eirone* from New Caledonia that lacks a midcoxal spine. Although we have not been able to

see the type of *impunctata*, *webbi* appears to be a different species based on Brown's description and illustrations of *impunctata*. A few specimens of *webbi* are small, relatively impunctate, and are the ferruginous color mentioned by Brown in his description of *impunctata* (1984). However, Brown does not mention the peculiar mesopleural lamellae seen in *webbi* and his illustration of the face of *impunctata* indicates that the clypeal truncation is considerably narrower than that of *webbi*.

KEY TO MALES OF THE NEW CALEDONIAN *EIRONE* SPECIES

1. Midcoxa without apical spine or tooth on posterior angle (as in Figs. 8, 11) 2
 - Midcoxa with apical spine or tooth on posterior angle (as in Figs. 9, 10) 6
2. Mesopleural lamella elongate, apically acute (Fig. 8) and bending ventrally; epipygium strongly narrowed apically and flattened in profile (as in Fig. 20) *webbi* Kimsey
 - Mesopleural lamella foreshortened, apically emarginate (as in Fig. 10), not bending ventrally; epipygium broadly rounded or truncate apically and strongly convex in profile (as in Fig. 21) 3
3. Small, body length 8 mm or less *impunctata* Brown
 - Larger, body longer than 8 mm 4
4. Flagellomere I barely twice as long as broad; metasomal setae blackish; clypeus strongly convex medially, apex narrowly truncate, truncation narrower than distance from the outer margin of one antennal socket to that of the other; wing membrane dark amber *nigra* Brown
 - Flagellomere I more than twice as long as broad; metasomal setae pale, silvery to yellowish; clypeus flattened medially, apex broadly truncate, truncation as wide or wider than distance from the outer margin of one antennal socket to that of the other; wing membrane yellowish to light brown tinted 5
5. Body black; clypeus with lateral angles of apical truncation acute or dentate; hypopygium apically truncate *emarginata* Brown
 - Body predominantly orange, with some black and yellow; clypeus with apical truncation broadly angulate laterally (Fig. 4); hypopygium apically broadly rounded *maigretae* Baptiste
6. Mesopleural lamella abbreviated and emarginate posteriorly 7
 - Mesopleural lamella not abbreviated, rounded or acute posteriorly 9
7. Sternum I medially keeled, posterior margin pointed medially and extending over base of sternum II (Fig. 14); clypeal apex bilobate; hypopygium apically bilobate (Fig. 18) *salteri* Brown
 - Sternum I flattened posteriorly (as in Fig. 13); clypeus broadly rounded in profile, with broad subrectangular apical bevel 8
8. Clypeal apex in ventral view bilobate, apical bevel nearly horizontal in profile *nepouiensis* Baptiste
 - Clypeal apex in ventral view broadly rounded, apical bevel oblique in profile *transversa* Brown
9. Clypeus subapically bulging, with polished medial knob and subtriangular apical bevel, nasiform in profile (Fig. 7) *nasalis* Kimsey
 - Clypeus subapically flattened or broadly rounded, apex truncate or medially lobate (as in Figs. 2-6) 10

10. Clypeal apex medially clearly convex or lobate (Figs. 2, 3, 5) 11
 - Clypeal apex truncate, flat or concave (Figs. 4, 6) 15

11. Metasomal sternum I medially keeled, posterior margin pointed medially and extending over base of sternum II (Fig. 12 and as in Fig. 14); clypeus weakly trilobate *irwini* Baptiste
 - Metasomal sternum I posteriorly flattened or arched, if arched then abruptly declivitous before base of sternum II, not overlapping II (as in Figs. 12, 13, 15); clypeus convex or trilobate (Figs. 2, 3), or unilobate (Fig. 5) 12

12. Clypeal apex medially unilobate (Fig. 5) 13
 - Clypeal apex medially convex or trilobate 14

13. Metasomal sternum I strongly keeled and abruptly declivitous posteriorly (as in Fig. 12) *anone* Kimsey
 - Metasomal sternum I gently convex medially gently sloping posteriorly to sternum II *obtusidens* Turner

14. Clypeal apex medially obtusely rounded and thin-edged, without bevel (Fig. 3), broadly convex in profile; epipygium apicomedialemarginate (Fig. 20) *laniensis* Baptiste
 - Clypeal apex medially broadly trilobate and projecting anteriorly, with well-developed horizontal bevel seen in ventral view (Fig. 2); epipygium apicomedialemarginate or truncate *koghisica* Kimsey

15. Gena with tooth-like projection adjacent to mandibular condyle (Fig. 6); mesopleuron medially tuberculate; propodeum sublaterally tuberculate *paniensis* Kimsey
 - Gena rounded or with small angle adjacent to mandibular condyle (as in Figs. 2, 3, 5); mesopleuron and propodeum not tuberculate (except propodeum in *neocaledonica*) 16

16. Epipygium terminating in long digitate apicolateral lobes, flattened medially (Fig. 17); propodeum sublaterally tuberculate *neocaledonica* Williams
 - Epipygium apically truncate or rounded, without digitate lobes; propodeum evenly convex, not tuberculate 17

17. Sternum I strongly arched and abruptly declivitous before base of sternum II (as in Fig. 12); clypeus with polished subapical tubercle and polished and thickened apical margin *subtuberculata* Brown
 - Sternum I broadly rounded or elevated medially and extending obliquely to posterior margin (as in Fig. 15); clypeus without subapical tubercle, with thin apical margin 18

18. Terga VI and VII with dense tufts of long dense setae; body color black *rivierensis* Baptiste
 - Terga VI and VII without dense tufts of setae, setae long and scattered; color black to orange *colorata* Brown

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